


## PATENT COOPERATION TREATY

## PCT

INTERNATIONAL PRELIMINARY EXAMINATION REPORT  
(PCT Article 36 and Rule 70)

Applicant's or agent's file reference YCT-877	<b>FOR FURTHER ACTION</b> See Notification of Transmittal of International Preliminary Examination Report (Form PCT/PEAA416)	
International application No. PCT/JP 03/13629	International filing date (day/month/year) 24.10.2003	Priority date (day/month/year) 31.10.2002
International Patent Classification (IPC) or both national classification and IPC G01N15/14		
Applicant AMERSHAM BIOSCIENCES K.K. et al.		
<p>1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.</p> <p>2. This REPORT consists of a total of 6 sheets, including this cover sheet.</p> <p><input checked="" type="checkbox"/> This report is also accompanied by ANNEXES, i.e. sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).</p> <p>These annexes consist of a total of 2 sheets.</p>		
<p>3. This report contains indications relating to the following items:</p> <p>I <input checked="" type="checkbox"/> Basis of the opinion</p> <p>II <input type="checkbox"/> Priority</p> <p>III <input type="checkbox"/> Non-establishment of opinion with regard to novelty, inventive step and industrial applicability</p> <p>IV <input type="checkbox"/> Lack of unity of invention</p> <p>V <input checked="" type="checkbox"/> Reasoned statement under Rule 66.2(a)(ii) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement</p> <p>VI <input type="checkbox"/> Certain documents cited</p> <p>VII <input type="checkbox"/> Certain defects in the international application</p> <p>VIII <input type="checkbox"/> Certain observations on the international application</p>		
Date of submission of the demand  17.05.2004	Date of completion of this report  24.02.2005	
Name and mailing address of the international preliminary examining authority:   European Patent Office - P.B. 5818 Patentlaan 2 NL-2280 HV Rijswijk - Pays Bas Tel. +31 70 340 - 2040 Tx: 31 651 epo nl Fax: +31 70 340 - 3016	Authorized Officer  Koch, A  Telephone No. +31 70 340-3828	



**INTERNATIONAL PRELIMINARY  
EXAMINATION REPORT**

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**I. Basis of the report**

1. With regard to the **elements** of the international application (*Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rules 70.16 and 70.17)*):

**Description, Pages**

1-11 as originally filed

**Claims, Numbers**

1-7 received on 06.08.2004 with letter of 06.08.2004

**Drawings, Sheets**

1/3-3/3 as originally filed

2. With regard to the **language**, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

These elements were available or furnished to this Authority in the following language: , which is:

- ☐ the language of a translation furnished for the purposes of the international search (under Rule 23.1(b)).  
☐ the language of publication of the international application (under Rule 48.3(b)).  
☐ the language of a translation furnished for the purposes of international preliminary examination (under Rule 55.2 and/or 55.3).

3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

- ☐ contained in the international application in written form.  
☐ filed together with the international application in computer readable form.  
☐ furnished subsequently to this Authority in written form.  
☐ furnished subsequently to this Authority in computer readable form.  
☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.  
☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. The amendments have resulted in the cancellation of:

- ☐ the description, pages:  
☐ the claims, Nos.:  
☐ the drawings, sheets:

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5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed (Rule 70.2(c)).

*(Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.)*

6. Additional observations, if necessary:

**V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**

**1. Statement**

Novelty (N)	Yes: Claims	3,4,7
	No: Claims	1,2,5,6
Inventive step (IS)	Yes: Claims	
	No: Claims	1-7
Industrial applicability (IA)	Yes: Claims	1-7
	No: Claims	

**2. Citations and explanations**

**see separate sheet**

**Re Item V**

**Reasoned statement with regard to novelty, inventive step or industrial applicability;  
citations and explanations supporting such statement**

Reference is made to the following documents:

- D1: WO 02/47246 A (YOSHIMINE HIROSHI ;SOTA HIROYUKI (JP); OKAHATA YOSHIO (JP); AMERSH) 13 June 2002 (2002-06-13)  
D2: PATENT ABSTRACTS OF JAPAN vol. 016, no. 085 (P-1319), 28 February 1992 (1992-02-28) & JP 03 269365 A (MATSUSHITA ELECTRIC IND CO LTD), 29 November 1991 (1991-11-29)

1. The present application does not meet the criteria of Article 33(1) PCT, because the subject-matter of claims 1 and 5 is not new in the sense of Article 33(2) PCT:
  - 1.1 The document D1 referring to a multiple quartz oscillator sensor with corresponding circuits and shielded housings in the embodiment of figure 7 is regarded as being the closest prior art to the subject-matter of claim 1 and discloses (the references in parentheses applying to this document):  
Method for preventing signal coupling between two or more chip-based mounted piezoelectric resonator sensors in a sensor system wherein the sensors are connected in series or parallel (page 25, line 20- p. 26, l. 20 with p. 10, l. 10-16; p. 22, l. 6-15; fig. 7) and each sensor has a flowcell body provided with its own resonator connected to its own oscillator circuit and its own power supply (p. 11, l. 14-18; p. 22, l. 12-15 with p. 19, l. 6-p. 20, l. 7; p. 20, l. 14-21; figs. 6 and 7), characterised by the steps of providing each sensor with its own, individual conducting shield which substantially surrounds said oscillator circuit and by connecting said conducting shield to one pole of the power supply (p. 25, l. 20-p. 26, l. 20: "...by connecting the external switch 35 through the relay 36 with the oscillation circuit section to keep the electrical shield effective"; p. 22, l. 6-15; figs. 6, 7 and 10).
  - 1.2 Regarding the technical features of claim 5, the document D1 discloses (the references in parentheses applying to this document):  
Piezoelectric resonator sensor (page 5, lines 6-8) comprising a body comprising a resonator (p. 20, l. 14-p. 21, l. 1; fig. 6) connected to an oscillator circuit (p. 21, l. 1-6; fig. 6) and a power supply (p. 26, l. 21 and 22) characterised in that said oscillator

circuit is substantially surrounded by a conducting shield (p. 9, l. 22-p. 10, l. 3; p. 25, l. 20-p. 26, l. 13) which shield is connectable to one pole of the power supply (p. 25, l. 20-p. 26, l. 6; fig. 10).

Moreover, in the present wording of claim 1 the feature of a shield "**connectable** to one pole of the power supply" is optional (Article 6 PCT).

2. Likewise, the technical features of dependent claims 2 and 6 beyond those of the claims to which they refer are also anticipated by D1 (p. 25, l. 20-p. 26, l. 20 with p. 22, l. 12-15; figs. 6 and 7). Therefore these claims do not comply with Articles 33(1) and (2) PCT.
3. The present application does not meet the criteria of Article 33(1) PCT, because the subject-matter of dependent claims 3, 4 and 7 do not involve an inventive step in the sense of Article 33(3) PCT:
  - 3.1 The technical features added by claim 3 which are not known from the document D1 consist of
    - coating substantially all of the outer surfaces of said flowcell body with a conducting material.Coating non-conducting materials of a device by a conducting material and connecting this conducting layer to a fixed potential (e.g. ground) for preventing electromagnetic noise and stray fields is common knowledge of the skilled person and does not require an inventive step.
  - 3.2 The technical features added by claims 4 and 7 are known from D2 describing a piezo-electric acceleration sensor with a metal case 23 for shielding the sensor which metal case does not surround the whole sensor housing. The skilled person would recognize the advantage of reaching the same technical result with less material consumption (and costs), would therefore implement the shield known from D2 into the flowcell sensor of D1 and arrive at the method of claim 4 and the device of claim 7, without an inventive step being involved. Since D2 also describes a microstructured piezoelectric sensor, the skilled person would come across document D2 during search, even though D2 does not describe a flowcell sensor.

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4. None of the present claims seems to comply with Articles 33(1)-(3) PCT.

REPLACED BY  
ART 34 ANDT

CLAIMS

1) Method for preventing signal coupling between two or more chip-based mounted piezoelectric resonator sensors (G'; G'') in a sensor system wherein each sensor  
5 (G'; G'') has a flowcell body (C'; C'') provided with its own resonator (3'; 3'') connected to its own oscillator circuit (29'; 29'') and its own power supply (35'; 35''), characterised by the steps of providing each sensor (G' ; G'') with its own, individual conducting shield (44'; 44'') which substantially surrounds said oscillator circuit (29'; 29'') and by connecting said conducting shield (44'; 44'') to one pole of the power  
10 supply (35'; 35'').

2) Method in accordance with claim 1 wherein each said shield (44'; 44'') substantially surrounds its respective flowcell body (C'; C'').

15 3) Method in accordance with claim 1 or 2 characterised in that the step of providing each sensor (G', G'') with its own, individual conducting shield (44', 44'') which substantially surrounds said sensor (G'; G'') comprises the steps of making a flowcell body (C', C'') out of a non-conducting material and coating substantially all of the outer surfaces of said flowcell body with a conducting material.

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4) Piezoelectric resonator sensor comprising a body (C'; C'') comprising a resonator (3'; 3'') connected to an oscillator circuit (29'; 29'') and a power supply (35'; 35''), characterised in that said oscillator circuit (29'; 29'') is substantially surrounded by a conducting shield (44'; 44'') which shield (44'; 44'') is connectable to one pole of the  
25 power supply (35'; 35'').

5) Piezoelectric resonator sensor in accordance with claim 4 characterised in that said conducting shield substantially surrounds said body (C'; C'').